SUPPORT FOR THE AMENDMENT

Support for the amendment to claim 2 is found on page 2, line 35 of the specification. Support for claim 5 is found on page 2, lines 9-10 of the specification. Support for claim 6 is found on page 2, lines 22-26 of the specification. Support for claim 7 is found on page 2, line 36 of the specification. Support for claim 8 is found on page 2, line 40 of the specification. Support for claims 9-10 is found on page 4, lines 1-2 of the specification. No new matter would be added to this application by entry of this amendment.

Upon entry of this amendment, claims 1-10 will now be active in this application.

REQUEST FOR RECONSIDERATION

The claimed invention is directed to a process for coating a substrate.

Applicant wishes to thank examiners Empie and supervisory patent examiner Cleveland for the helpful and courteous discussion held with his U.S. representative on May 19, 2008. At that time, applicant's U.S. representative argued that the reference description of a specific surface area diameter D_1 of **primary** particles of 1-100 nm and a ratio D_2/D_1 of the average particle size D_2 of the **secondary** particles of 1-10 failed to suggest the claimed mean particle size of from 0.5-9.9 nm. The following is intended to expand upon the discussion with the examiners.

Thin films having a high dielectric constant have applications in the field of semiconductors. Issues as to stability of stoichiometry which may affect dielectric constant and/or permanent polarizability have lead to further investigations of thin film forming processes.

The claimed invention addresses this problem by providing a method for coating a substrate comprising applying a suspension of crystalline oxide particles, evaporating a suspending medium, and sintering, wherein the crystalline oxide particles have a **mean**

particle size of **0.5-9.9 nm**. Applicant has discovered that sintering of such crystalline oxide nanoparticles provides for a film having desirable dielectric and ferroelectric properties. Such a process of sintering nanoparticles is nowhere disclosed or suggested in the cited reference of record.

The rejection of claim 1-4 under 35 U.S.C. § 103(a) over Ohmori et al. (U.S. 2002/0150531) is respectfully traversed.

Ohmori et al. **fails to disclose** or suggest sintering of crystalline oxide particles having a **mean particle size of 0.5-9.9 nm**.

Ohmori et al. describes a perovskite titanium-containing composite oxide particles having a specific surface area of about 10-200 m^2/g, a specific surface area diameter D_1 of the **primary particles** of about 10-100 nm and a ratio D_2/D_1 of about 1-10 wherein D_2 is the average particle size of the **secondary** particles. Thus, the reference describes a suspension comprising **primary particles** having a specific surface area diameter D_1 as calculated as $6/\rho S$ of 10-100 nm and **a ratio** of an average particle size D_2 of the **secondary particles** to a specific surface area diameter D_1 of primary particles of 1-10. The ratio D_2/D_1 appears to relate to the concentration of secondary particles relative to the concentration of primary particles and not to the relative size of the secondary and primary particles.

Paragraph [0005] identifies particles obtained by an oxalate method having a particle size of 0.2-0.5 μm (200-500 nm) as not sufficiently small while those produced by an alkoxide method to yield a particle size of 20-30 nm which, while sufficiently small are costly to synthesize.

Paragraph [0024] identifies a particle size range of titanium oxide particles of from about 5 to about 50 nm, wherein a size which is less than about 5 nm is discouraged as creating a difficult in the process of manufacture.

Example 1 in paragraph [0039] identifies particles having a specific surface area diameter D_1 of 0.03 μm (30 nm), an average particle size D_2 of secondary particles of 0.21 μm (210 nm) and a ratio of D_2/D_1 of 7. The data from the examples is summarized as follows:

	D_1 (nm)	D_2 (nm)	D_2/D_1
Example 2	20	190	9.5
Example 3	30	220	7.3
Example 3	50	100	2
Example 4	50	80	1.6

While the reference may not express a discrete average particle size range the secondary particles, the working examples illustrate average particle sizes for the **secondary particles** of 80-220 nm, well in excess of the claimed range of 0.5 to 9.9 nm.

Example 5 has been cited by the examiner as reporting a particle size of 43 nm. Applicant notes, that this is the particle size of **a sintered thin film** and **not of the particles suspended**.

In contrast, the claimed invention is directed to a process for coating a substrate in which a suspension of crystalline oxide particles having a **mean particle size** of from 0.5-9.9 nm is applied.

Applicant respectfully submits that the reference fails to disclose or suggest a **mean** particle size of 0.5-9.9 nm. The reference reports **a specific surface area diameter** D_1 of **primary particles** of 10-100 nm, but this is not a **mean** particle size for the suspension. Further, the measure D_1 is not a mean particle size of the primary particles but is calculated by the formula $D_1=6/\rho S$. The reference also reports an average particle size D_2 of **secondary** particles, but an average particle size of **secondary particles** does not suggest the mean particle size of the particles in the suspension. The disclosure of a specific surface area diameter of 10-100 nm, fails to suggest a mean particle size of 0.5 to 9.9 nm.

Moreover the claimed mean particle size of 0.5 to 9.9 nm would not have been obvious over the disclosed particles sizes as the reference teaches away from having any particles smaller than 5 nm. as being difficult to handle.

> However, while it may ordinarily be the case that the determination of optimum values for the parameters of a prior art process would be at least *prima facie* obvious, that conclusion depends upon what the prior art discloses with respect to those parameters. Where, as here, the prior art disclosure suggests the outer limits of the range of suitable values, and that the optimum resides within that range, and where there are indications elsewhere that in fact the optimum should be sought within that range, the determination of optimum values outside that range may not be obvious. We think it is not on the facts of this case (In re Sebek, 465 F.2d 902, 175 USPQ 93, 95 (CCPA 1972)).

It would simply not be obvious to use a smaller particle size than disclosed in the reference as the reference identifies difficulties in handling when particles of smaller than 5 nm are present. The larger reported average particle size of secondary particles, coupled with a disclosure that particles smaller than 5 nm should be avoided, would dissuade one of skill in the art from reducing the particle size of the reference. Why would one be motivated to reduce the particle size, when the reference already identifies that particles below 5 nm are difficult to handle? There would be no motivation as those of skill in the art would wish to avoid the difficulties in handling smaller particles.

As the reference fails to suggest a mean particle size of 0.5-9.9 nm and teaches away from using such a small particle size since a smaller particle size would be difficult to process in their method, the claimed invention is clearly not rendered obvious by the reference and accordingly withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

The objection to claim 2 has been obviated by appropriate amendment.

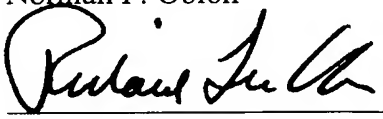
Applicant notes, that on April 29, 2005, **a corrected English translation** was submitted. This is **not a substitute specification** but rather a corrected English translation provided for under PCT practice and the appropriate processing fee of $130 was submitted therewith. As Applicant has not submitted a substitute specification, full processing of

Applicant's corrected English language translation filed on April 29, 2005, is respectfully requested.

Applicant submits that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



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